

The effect of Clavicle Band on patients with Parkinson's disease complicated with dropped head syndrome

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Abstract

The patients with Parkinson disease may have impaired ADL caused by the abnormal posture of a neck and the trunk. We performed posture adjustment using a Clavicle Band on a patient with Parkinson's disease who also had dropped head syndrome. Her diet movement was affected for anteflexion posture aggravation at the time of diet. As a result of wearing a harness, the exacerbation of the cervical anteflexion angle at the age of the short time was improved. Also, the breathing state and arm movements were not disturbed by this harness. The effectiveness of posture adjustment by the Clavicle Band for dealing with this disorder was shown.

Keywords: Parkinson's disease, abnormal posture, dropped head syndrome, cervical anteflexion angle, meal time

Introduction

In Parkinson's disease (PD), it is known that patients often experience complications due to the abnormal posture of the neck and trunk with the aggravation of disease. The cause of the abnormal posture may include Dystonia and rigidity of the neck and trunk line, and muscle weakness with aging and disuse. In particular, dropped head syndrome can occur, which is an abnormal posture of the neck [1-3]. As treatment, introduction of the deep brain stimulation technique (Deep Brain Stimulation; DBS) has been tried in addition to various medical therapies and botulinum toxin intramuscular

injections. However, the effect that all therapy can satisfy is not often obtained [2-3]. On the other hand, there are a few reports about the effectiveness of the rehabilitation for PD. Rehabilitation for Parkinson's disease patients presenting with abnormal posture has not been examined. We examined the effect of a new form of rehabilitation using a Clavicle Band for a PD patient who had dropped head syndrome. She felt fatigue due to the influence of cervical anteflexion posture during meals, and eating disorders had developed. We investigated the presence or absence of improvement of the diet movement using this harness.

Subjects

The subject was a 71-year-old woman with PD. An independent gait was possible, and she did not need assistance for everyday life. However, she often complained of fatigue during meals, and lengthening of mealtimes and a decrease in dietary intake were found. Regarding the ability to sit down, posture maintenance was possible if she sat in a chair by herself. However, remarkable cervical ante flexion posture presented. Furthermore, muscle fatigue presented with the course of the time, and cervical ante flexion was aggravated.

Methods

A Clavicle Band is an elastic orthosis which is commonly used as conservative therapy after the clavicle fractures (Figure 1). The upper part of the thoracic vertebra is held in an extended position by acting on extension /

extorsion of the cingulum extremitatis superioris by the traction power of this harness. We intended to trigger the Clavicle Band for the extension of the upper part of the thoracic vertebra from the neck. The following five items were analyzed during wearing and non-wearing of this harness: 1) subjective impression, 2) mealtimes, 3) vital s (respiration rate, oxygen saturation in blood, pulse rate, examination of the number of breaths), 4) change in neck ante flexion angle, 5) arm usability test (arm joint range of motion and simple arm function test). A sagittal section image of the diet posture was photographed with a digital camera, and the measurement of the cervical ante flexion angle set a landmark on an image in the body region. The cervical ante flexion angle was measured according to figure 2. Furthermore, the front and the angle change after the diet were calculated during a meal. The Clavicle Band was measured between food intake during non-wearing and wearing periods. We measured each item three times and the mean was calculated.

Table 1. Change of analyzed data before and after diet

	Harness non-wearing		Harness wearing	
	Before diet	After diet	Before diet	After diet
Time required for diet (min)	13.0		10.0	
Respiration rate (/min)	13.5	15.5	14.5	14.5
Oxygen saturation (%)	97.9		99.1	
Pulse rate (/min)	81.5		80.7	
Neck flexion angle	29.5	37.6	28.5	35.4
Δ neck flexion angle	8.1		3.2	



Figure 1. Clavicle Band

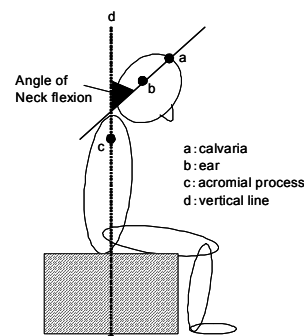


Figure 2. Measurement of neck flexion angle

Results

When the harness was put on, the patients felt that "it was hard for the head to fall forward, the posture remained strong, and it was easy to eat". Table 1 shows the change of analyzed data. It was mean 13 min at the time required for the diet at harness non-wearing. This was shortened to a mean of 10 min during harness wearing. Diet before and after showed increase in the number of breaths during harness non-wearing, but there was no in the increase of the number of breaths during harness wearing. The clear change was absent for SpO2 and the pulse. The cervical anteflexion angle increased after a meal, compared before a diet. The anteflexion angle decreased before a diet at the harness wearing. Also, the angle increase after meals decreased. No change appeared to be caused by harness wearing in the examination for joint excursion and a simple arm function test (data not shown).

Discussion

Dropped head syndrome is an anteflexion posture of the neck found in various kinds of neuromuscular disorders. In PD, this is relatively rare and is found in 5-6% of PD sufferers [2,4]. Fujimoto proposed two major pathophysiological mechanisms: 1) dystonia of the flexor neck muscles, and 2) weakness of the extensor neck muscles. In the former mechanism, the tone of the flexor neck muscles is extremely high and extension of the neck to its normal position is difficult [2]. The effect of both is considered in this case. Because the cervical anteflexion posture is aggravated at the time of diet, this patient felt fatigue for diet movement. As a result, lengthening of mealtimes and a decrease in dietary intake occurred. We showed that wearing a Clavicle Band caused improvement of the cervical anteflexion point of view at the table, leading to shortening of the mealtime.

That power of traction of Clavicle Band assisted muscular strength of the posterior neck is considered as mechanism.

Dystonia, a sustained muscular contraction frequently accompanied by abnormal

movements, postures or both, is sometimes found in patients with idiopathic Parkinson's disease (PD). There is general agreement that typical dystonia is quite uncommon in untreated PD, and a pathologically proven series of patients support this clinical dictum [5,6]. Dropped head syndrome is mainly found in patients with advanced Parkinson's disease. The sensory trick is an important characteristic of dystonia. Sensory input has a major role in the pathophysiology of dystonia; dystonic spasms are reproduced by stimulating muscle afferents as in the tonic vibration reflex, and are stopped by muscle afferent blocks. Therefore, stonia may be regarded as a disorder in matching sensory input to motor output [7]. In the present case, sensory stimulation of the skin by the Clavicle Band may act as a perception trick.

The Clavicle Band has the effects as harness including a limit of the articular movement and a fixation of the affected part. However, no bad influence was found on arm function or joint excursion when Clavicle Band was used with this patient. It was thought that this treatment was worth trying in PD patients who had serious, treatment-resistant dropped head syndrome in future.

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